

SHADE TEMPERATURE.

BY JOHN WALLACE, C.E.

ON passing from direct sunlight into the shade of a large tree, many people attribute their sense of coolness to a difference of temperature of the air, and if they used a thermometer in each position it would confirm their impression. But the impression is entirely wrong. In the open, the instrument has been exposed to two influences, the direct sun's ray and the air temperature, whereas under the tree it is only influenced by the air temperature (we may here ignore the effect of reflected sun rays). The air under the tree and outside of it is at the same temperature even if a breeze is blowing.

If the observer passes from the sunlight into a house, he has at first a sensation of coolness having just escaped from the sun, but after a while if he stands at the open door and admits the outer air, he finds that it is cooler than that within, which has been heated by contact with the walls and roof. The sun has only a moderate effect on the air that its rays pass through, but it rapidly heats solid objects which in their turn heat the air by contact, and so the ground is heated and in turn heats the air, similarly the building is heated and warms the contained air. But there is this difference between the two examples, the air in contact with the ground when heated immediately rises, giving place to cooler air, thus preventing too great rise of temperature, but the air in the house cannot escape, and its temperature continues to rise so that when closed for some time in hot weather and suddenly entered, it feels like an oven.

At night there is a very active radiation of heat from the ground into space, and so it is much cooled before sunrise but the house, protected by its roof, cannot cool in the same way and its temperature is much higher than that of the outer air. We now begin to see that shade temperature cannot be ascertained by any thermometer in any shade. The instrument must be carefully shaded in a specially constructed building that excludes the sun's direct or reflected ray but lets the air circulate freely through it. This marks the difference between an ordinary house and an observatory and explains why the published figures of the observatory do not agree with the readings of any thermometer in an ordinary building. It also emphasises the importance of free circulation of air which will always rise when heated if it can find a passage.

In an ordinary house there is no passage for the escape of heated air which stagnates overhead unless it is drawn down by an electric fan to be used over again. It has often been noticed that air of the same temperature in the shade has a different feeling at one time and another with regard to coolness. If dry it always feels cooler than when damp. A small room with a still atmosphere may feel comfortable when entered, but after a while it is less comfortable. This is due to a change that has taken place. The tenant of

the room is producing a warmer and damper atmosphere around him that gradually interferes with cooling if there is no air current. This also occurs at night when the air is damper than in the day time and the cooling process is interfered with by bedding and a curtain.

These simple truths gain much in importance in the sick room and the hospital; warm air will flow upwards naturally but it will not flow horizontally unless forced. It will not flow upwards unless a suitable outlet is provided. Of this fact a striking illustration was furnished at the Maratha plague hospital a few years ago. A new ward had been built of one storey with a red tiled roof, and the roof had at least forty ventilating tiles in it which were intended to allow warm air to escape. When finished, but still unoccupied, a visitor was allowed to make an experiment. He burnt some wet straw on the floor and filled the ward with smoke. There was no wind, and he watched in vain for any appearance of smoke at the ventilators. There was none at all. Presently a faint breeze arrived and entered beneath the eaves. It carried all the smoke out through the similar opening on the other side of the ward. The ventilators were far too small to serve their purpose. Another experiment was made by limewashing the outside of the tiles of this ward and hanging a thermometer in it for comparison with the other wards. On asking the nurses for comparative readings, they replied that there was no need to take readings of the thermometers, they could feel the difference in reduced temperature as soon as they got below the white washed roof.

It is hardly necessary to dwell on the importance of this subject in India.

THE LADY HARDINGE HOSPITAL FOR WOMEN.

By Miss MACKENZIE.

ON March 17th the new indoor block of the Lady Hardinge Hospital at Delhi was opened by Her Excellency Lady Chelmsford.

By 3-30 p.m. a crowd of English and Indian ladies had arrived, and were accommodated on chairs placed in the open quadrangle between the two wards. The green lawn, dotted with rose bushes, and with the bright colours of the visitors' dresses, presented a very pleasing picture. Among the visitors were medical women from the district, and others resident in Delhi itself. These together with the Staff of the College and Hospital were in their College gowns and caps, and were a striking feature of the scene.

Punctually at 4 p.m. Her Excellency Lady Chelmsford arrived, and was received by the Principal of the College, Dr. Kate Platt, who presented to Her Excellency the members of the College and Hospital Staff. Her Excellency was then conducted to a raised dais facing the quadrangle on which were also seated Lady Munro, the wife of the Commander-in-Chief in India, Dr. Kate Platt, Dr. Ruth Wilson, Surgeon to the Lady Hardinge